

CANDIDATE
NAME

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CENTRE
NUMBER

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CANDIDATE
NUMBER

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MATHEMATICS

0626/02

Paper 2 (Extended)

October/November 2017

1 hour

Candidates answer on the Question Paper.

Additional Materials: Geometrical instruments
 Tracing paper (optional)

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.

Write in dark blue or black pen.

You may use an HB pencil for any diagrams and graphs.

Do not use staples, paper clips, glue or correction fluid.

DO NOT WRITE IN ANY BARCODES.

Answer **all** questions.

Electronic calculators should be used.

If working is required for any question it must be shown below that question.

If the degree of accuracy is not specified in the question, and if the answer is not exact, give the answer to three significant figures. Give answers in degrees to one decimal place.

For π , use either your calculator value or 3.142.

At the end of the examination, fasten all your work securely together.

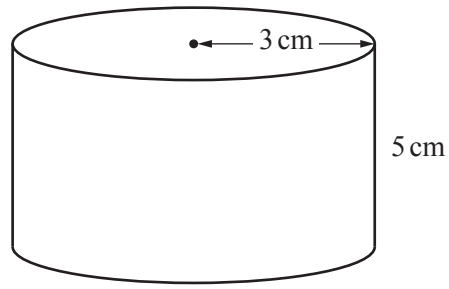
The number of marks is given in brackets [] at the end of each question or part question.

The total of the marks for this paper is 60.

This syllabus is regulated for use in England as a Cambridge International Level 1/Level 2 (9–1) Certificate.

This document consists of **14** printed pages and **2** blank pages.

1

NOT TO
SCALE

Work out the volume of this cylinder.

..... cm^3 [2]

2 (a) Solve the inequality.

$$7x - 2 \leq 19$$

..... [2]

(b) Represent your solution on the number line.



[1]

- 3 Solve the equation.

$$7(8 - 2x) = 35$$

$x = \dots\dots\dots$ [3]

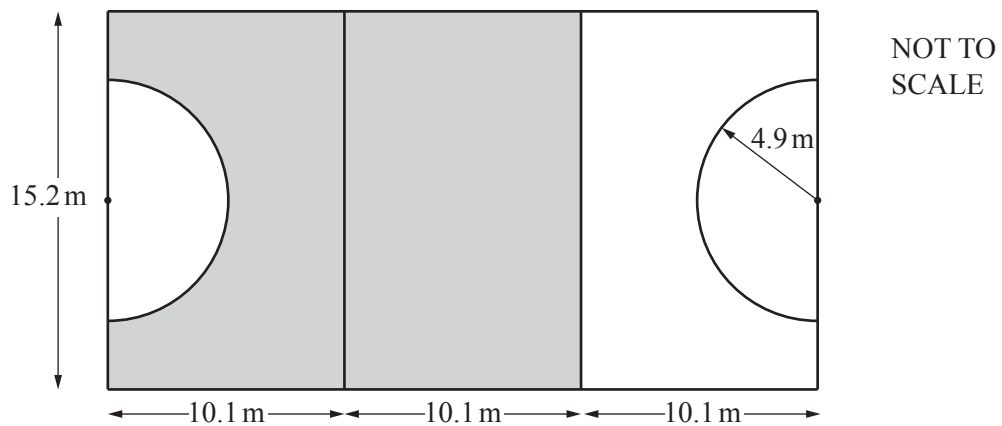
- 4 Jess carries out a survey to find out if Year 11 students in her school want to have a summer ball. There are 360 students in Year 11.

She selects a systematic sample of 20 of these students to survey.

Explain clearly how she selects these 20 students.

.....
.....
..... [2]

5



The diagram shows a netball court.
It consists of three identical rectangles with two semi-circles.

Each rectangle is 15.2 m long and 10.1 m wide.
Each semi-circle has radius 4.9 m.

The Wing Attack player can move anywhere in the shaded area.

What percentage of the whole court can the Wing Attack player move in?

..... % [4]

6 Simplify.

$$7x^2y^3 \times 2x^5y$$

..... [2]

7 Make c the subject of this formula.

$$S = cd + 3dh$$

..... [2]

- 8 $\frac{22}{7}$ and $\frac{7}{3}\left(1 + \frac{\sqrt{3}}{5}\right)$ can both be used as approximations for π .

The actual value of π is 3.141 59 correct to 5 decimal places.

Show that $\frac{7}{3}\left(1 + \frac{\sqrt{3}}{5}\right)$ is the better approximation for π .

[3]

- 9 A purple case contains x red cartons.
Each red carton contains y green boxes.
Each green box contains z counters.

$$x > y > z > 1$$

Altogether there are 455 counters in the purple case.

Find the values of x , y and z .

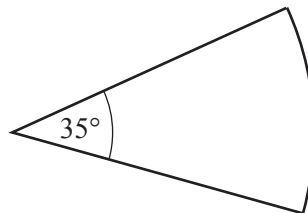
$x = \dots\dots\dots$, $y = \dots\dots\dots$, $z = \dots\dots\dots$ [3]

- 10** Harry bought his car a year ago.
The value of his car has fallen by 12% since he bought it.
The car is now worth £14 520.

What was the price of his car when he bought it?

£ [3]

- 11** This is a sector of a circle, radius 6 cm.



NOT TO
SCALE

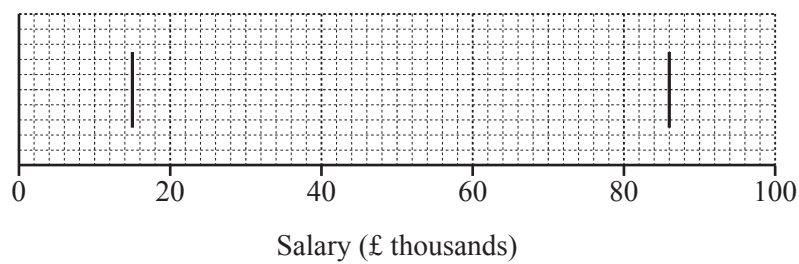
Calculate the perimeter of this sector.

..... cm [3]

- 12 The table shows information about the salaries of the employees in a company.

	Salary
Greatest	£86 000
Least	£15 000
Median	£32 000
Lower Quartile	£24 000
Upper Quartile	£46 000

- (a) Complete this box plot.



[2]

- (b) Complete the following.

- (i) The inter-quartile range is £ [1]
- (ii) Three quarters of the employees earn at least £ [1]

13 $f : x \mapsto 4x - 3$

$g : x \mapsto x^2$

(a) Find $f^{-1}(x)$.

$f^{-1}(x) = \dots\dots\dots$ [2]

(b) Archie is asked to find $fg(x)$.

(i) This is his solution.

$$f(x) = 4x - 3$$

$$\text{So } fg(x) = (4x - 3)^2$$

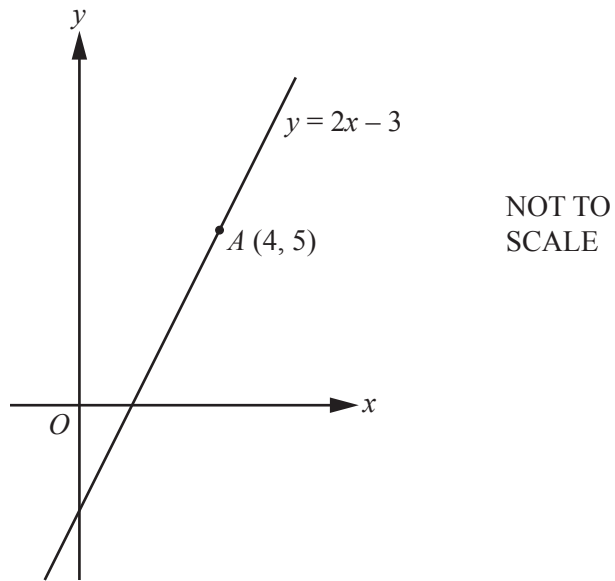
Archie has made an error.
Explain his error.

.....
..... [1]

(ii) Find $fg(x)$.

$fg(x) = \dots\dots\dots$ [1]

14

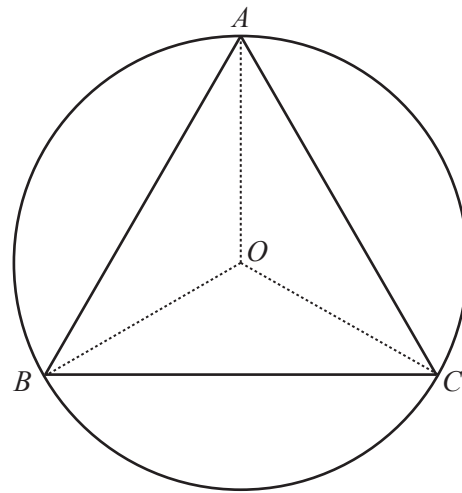


The line $y = 2x - 3$ passes through the point A with coordinates $(4, 5)$.

Find the equation of the straight line that passes through A and is perpendicular to $y = 2x - 3$.

..... [3]

15

NOT TO
SCALE

An equilateral triangle, ABC , is inscribed in a circle with centre O and radius 5 cm.

(a) Work out the length of the line BC .

$BC = \dots\dots\dots$ cm [4]

(b) Work out the area of triangle ABC .

$\dots\dots\dots$ cm² [2]

- 16 (a) Show that $x^2 - 5x + 3 = 0$ can be written as $x = 5 - \frac{3}{x}$.

[2]

- (b) Find an approximate solution, correct to 2 decimal places, to $x^2 - 5x + 3 = 0$.

Use the iteration formula $x_{n+1} = 5 - \frac{3}{x_n}$ with $x_1 = 4$.

Show the result of each iteration.

$x = \dots\dots\dots$ [3]

- 17 (a) Show that $x^2 - 4x + 7 = (x - 2)^2 + 3$.

[1]

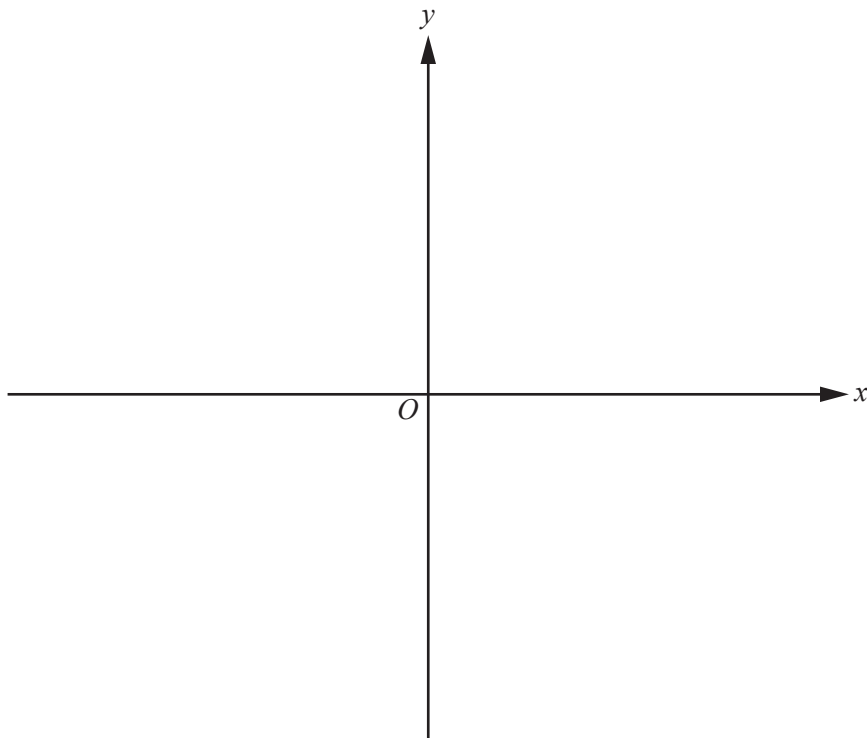
- (b) Explain why the equation $x^2 - 4x + 7 = 0$ has no solutions.

.....
 [1]

- (c) Write down the co-ordinates of the turning point of $y = x^2 - 4x + 7$.

(..... ,) [1]

- (d) Sketch the graph of $y = x^2 - 4x + 7$ on the grid.



[2]

18 Jackie is a javelin thrower.

She must throw over 55 metres in at least one of 3 throws to qualify for an athletics event.

The probability of her throwing over 55 metres in any one throw is p .

The probability of her **not qualifying** for the athletics event is $\frac{125}{343}$.

Find the value of p .

$p = \dots\dots\dots$ [3]

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